National Institute of Environmental Health Sciences

Associations between extreme precipitation and gastrointestinal-related hospital admissions in Chennai, India

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Abstract:

Background: Understanding the potential links between extreme weather events and human health in India is important in the context of vulnerability and adaptation to climate change. Research exploring such linkages in India is sparse. Objectives: We evaluated the association between extreme precipitation and gastrointestinal (GI) illness-related hospital admissions in Chennai, India, from 2004 to 2007. Methods: Daily hospital admissions were extracted from two government hospitals in Chennai, India, and meteorological data were retrieved from the Chennai International Airport. We evaluated the association between extreme precipitation (≥ 90th percentile) and hospital admissions using generalized additive models. Both single-day and distributed lag models were explored over a 15-day period, controlling for apparent temperature, day of week, and long-term time trends. We used a stratified analysis to explore the association across age and season. Results: Extreme precipitation was consistently associated with GI-related hospital admissions. The cumulative summary of risk ratios estimated for a 15-day period corresponding to an extreme event (relative to no precipitation) was 1.60 (95% CI: 1.29, 1.98) among all ages, 2.72 (95% CI: 1.25, 5.92) among the young (≤ 5 years of age), and 1.62 (95% CI: 0.97, 2.70) among the old (≥ 65 years of age). The association was stronger during the pre-monsoon season (March-May), with a cumulative risk ratio of 6.50 (95% CI: 2.22, 19.04) for all ages combined compared with other seasons. Conclusions: Hospital admissions related to GI illness were positively associated with extreme precipitation in Chennai, India, with positive cumulative risk ratios for a 15-day period following an extreme event in all age groups. Projected changes in precipitation and extreme weather events suggest that climate change will have important implications for human health in India, where health disparities already exist.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3948034

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Meteorological Factors, Precipitation, Temperature, Other Exposure

Temperature: Fluctuations

Other Exposure: apparent temperature

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: India

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease, Morbidity/Mortality

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease (other): gastrointestinal ilnesses

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Children, Elderly

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified